



Economy Topic Team Public Policy

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$$\left[\frac{p^2}{2\mu} + V(r) \right] \psi(r) = E \psi(r)$$

California Hydrogen Highways

www.hydrogenhighway.ca.gov

Purpose

- Financing the Hydrogen Highway may require a bold new funding initiative
- Existing federal, state, and local policies and funding programs have the potential to be modified to accommodate Hydrogen Highway initiatives



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Public Policy

	Private Resources	Public Resources
Franchise Concepts	X	
Mandates	X	X
Cross-Subsidies		X
Direct/New Subsidies		X
Non-Profit Contributions	X	
Other	X	X



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What Influences Policy Creation?

- Global Warming Concerns (GHGs)
- California Energy Crisis
- Petroleum Dependence (AB 2076 report)
- Energy Security
- Health Issues



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Annual Health Costs due to Conventional Motor-Vehicle Emissions

Study	Region	Pollutants Evaluated	Annual Health Costs (billions) (2004\$)
McCubbin and Delucchi (1996 & 1999)	U.S.	CO, NO ₂ , O ₃ , PM _{2.5} , PM ₁₀ and Toxics	\$26 to \$394
Mackenzie, et al. (1992)	U.S.	Illness due to Air Pollution	\$14
Worldwatch Institute (1993)	U.S.	Illness due to Air Pollution	\$129
Small and Kazimi (1995)	South Coast Air Basin	PM ₁₀ and O ₃	\$5 to \$27
Hall (1992)	South Coast Air Basin	PM ₁₀ and O ₃	\$7 to \$32
Krupnick and Portney (1991)	South Coast Air Basin	PM ₁₀ and O ₃	\$5
McCubbin and Delucchi (1996 & 1999)	Los Angeles	CO, NO ₂ , O ₃ , PM _{2.5} , PM ₁₀ and Toxics	\$7 to \$110



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“Real” Societal Cost of Gasoline

- Pump Price
- Externalities (could be greater than pump price)
 - Health Costs associated with air pollution
 - Petroleum dependence (economics)
 - Refinery emissions/distribution emissions
 - Other (GHGs, water, crops, noise, etc.)
- Hydrogen Highway addresses all above
- Cost Avoidance should warrant state investment



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Greenhouse Gas Reduction

- Hydrogen from renewables opens the potential for carbon credit trading
- Exists in Europe
- Could be adopted for U.S.
- Could stimulate renewable energy and hydrogen from renewables



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Policies to Create Funding

- Bonds (revenue or general obligation)
- New fees/taxes
- Qualification of Hydrogen Highway projects for existing programs
 - Moyer Program
 - Calif. DG Program
 - Utility LEV Programs
 - AB 2766
 - MSRC
 - FAA VALE



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Policies to Stimulate Market

- Mandates
 - Federal, State, and/or Local Policies
- Financial assistance
 - Hydrogen production and/or stations
 - Vehicle purchase
 - Green energy production
 - Others??



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Mandates

- CARB requirements for Alternate Fuel Stations
 - 20,000 vehicle trigger
- EPACT guidelines for Federal, State fleets
- CARB Transit Rule
- SCAQMD Fleet Rules for Public Fleets
- State Fleet Purchase Guidelines



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Incentives

- Traditional way to stimulate market
 - Factory rebates
- Key is “stimulate” vs “buy”
- Incentives traditionally cover some/all of differential cost of new technology



$$\left[\frac{p^2}{2\mu} + V(r) \right] \psi(r) = E \psi(r)$$

Incentives (cont.)

- Tax credits
- Fuel price subsidies
- Utility incentive tariffs
- Low interest loans
- Permitting waivers
- R&D grants
- DG connection
- Buydown incentives
- Cost sharing
- Economic development zones
- HOV lane access
- Free parking
- Tax incentives to OEMs
- Credits



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Your Ideas for Policies

- ???



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